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ML Directorate research may lead to multi-purpose grease

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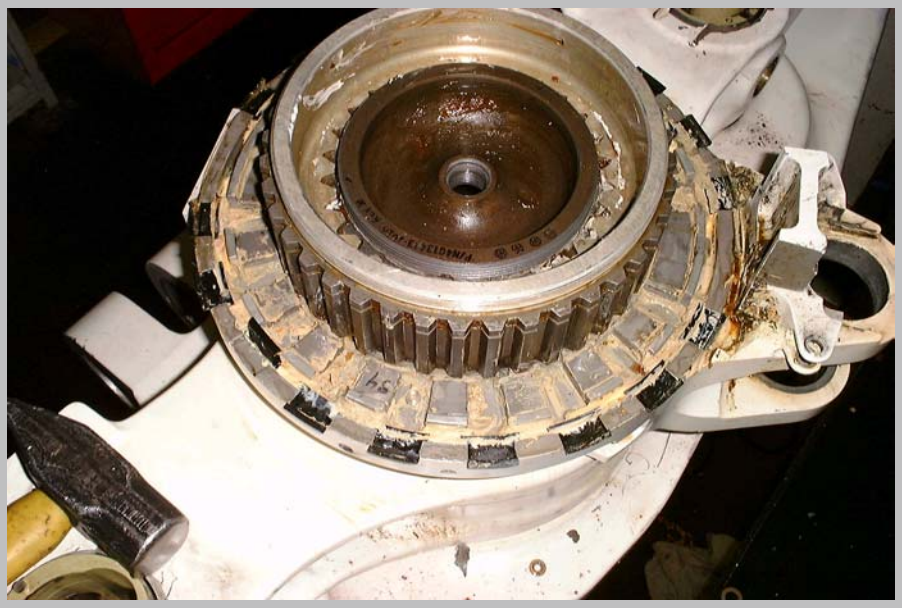
WRIGHT-PATTERSON AIR FORCE BASE, Ohio — When Air Force researchers were recently asked by representatives at Ogden Air Force Base, Utah, to analyze wear and rusting challenges plaguing the C-5 Galaxy aircraft, they determined that a unique grease they'd developed to solve a problem in cruise missile bearings may provide a solution.

Collaborative research, spearheaded by Air Force Research Laboratory Materials and Manufacturing's Directorate, led to the discovery of MIL-PRF-32014 military qualifying grease, a reliable, low-cost replacement grease for use in cruise missiles.

Researchers predict that the lubricant will generate savings for the Air Force by eliminating costs associated from C-5 maintenance that may be the result of corrosion, rust and wear.



The main landing gear strut from the C-5 landing gear assembly is coated in grease. This strut also shows signs of corrosion and wear.

In the late 1980s, researchers from the directorate's nonstructural materials branch began working with various grease companies to find a commercial source of grease to replace a mineral oil sodium soap thickened product used in cruise missiles.

While in storage, the mineral oil product reacted with air moisture and bled out of bearings.

Due to the high cost to overhaul the missiles and re-grease bearings, researchers sought grease that could be stored in adverse conditions. The grease also had to meet extreme operational requirements.

The C-5 landing gear assembly contains wheel bearings and other parts, which are exposed to moisture and rain, air, bacterial decontaminants and other phenomena that encourage corrosion.

These parts are coated in grease and lubricated regularly to make them more effective, however changes in the chemical or physical properties of the grease that coats these unique systems also occur under these environmental conditions.

"Though AMOCO had discontinued their lubricants branch, Nye Lubricants, a small business that specializes in specialty lubes, had commercialized a MIL-PRF-32014 qualifying grease called Rheolube 374A," said Ed Snyder, a researcher in the directorate.

Long term testing of the Rheolube 374A grease is currently being conducted, though the success of the grease has already been validated by several military and commercial agencies.

ML researchers have conducted sophisticated high-humidity and high-speed testing of the grease over long periods of time and in adverse conditions. @